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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/581,990	06/21/2000	Yosi Bar-Erez	1529	8047

7590 05/05/2004  
Mark Friedman  
Suite 207  
2001 Jefferson Davis Highway  
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EXAMINER

HAWKINS, CHERYL N

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/581,990

Applicant(s)

BAR-EREZ, YOSI

Examiner

Cheryl N Hawkins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 26-45, 51, 52, 55 and 56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-45, 51, 52, 55 and 56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2000 and 30 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26-29, 51, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817) in view of Kinzie (US 6,136,132). As to Claims 26 and 51, Feygin et al. discloses a method of making a three-dimensional object (Figure 2) constituted of a plurality of thin preformed sheets (Figure 1, layers 56) each bonded on one side to the next adjacent sheet on its opposite side, with each sheet cut along a contour (Figure 2, contour line) corresponding to the contour of the respective layer constituted by the sheet in the object, the method comprising bonding one side of a sheet to the opposite side of an adjacent sheet such that the remaining portion of the sheet not within the contour is readily separable from the three-dimensional object (Figure 2, cross hatching 82; column 5, lines 55-67; column 6, lines 1-2). Feygin et al. does not disclose the selective deployment of a releasing agent on one side of the sheet. One of ordinary skill in the art at the time of the invention would recognize the advantage of preventing the waste material from undesirably adhering to the sheets forming the three-dimensional object. Kinzie discloses a method of making a three-dimensional object in which a release coating is applied to prevent undesired adhesion (column 12, lines 4-9). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method

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of Feygin et al. to include selectively coating the top side of each sheet with a releasing agent as disclosed by Kinzie to prevent undesired adhesion of the portion of the sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object.

As to Claim 27, the references as combined (Feygin et al., column 8, lines 15-17; Kinzie, column 12, lines 4-9) disclose a method in which the bottom side of each sheet is covered on its complete surface with an adhesive to promote bonding of all the sheets to form the three-dimensional object except where covered by the releasing agent.

As to Claim 28, the references as combined (Feygin et al., column 8, lines 15-17; Kinzie, column 12, lines 4-9) disclose a method in which the adhesive is applied to the under surface of the sheets and the releasing agent is applied to the upper surfaces of the sheets.

As to Claim 29, the references as combined (Feygin et al., Figure 1, layers 56, stack 58, work table 130; column 7, lines 54-57) disclose a method in which the sheets are individually fed to and stacked on a horizontal table, which is successively lowered as the sheets, are successively stacked thereon.

As to Claim 55, the references as combined disclose a method wherein the releasing agent is applied on at least one of the sheets over a major portion of the surface of the sheet not included within the respective contour (see Claim 1).

3. Claim 30 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817) and Kinzie (US 6,136,132) as applied to claim 29 above, and further in view of Belanger, Jr. (US 4,721,453). The references as combined do not disclose coating each sheet on its upper surface outside of its respective contour with a releasing agent as the sheet is fed to the horizontal table to be stacked on top of the other sheets. Belanger, Jr. discloses an

apparatus which utilizes a release agent applicator to coat the upper surface of a web being fed through a manufacturing operation (Figure 1, sprayer 36; column 3, lines 18-24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of the references as combined to include applying a releasing agent to the top side of each sheet as the sheet is fed to horizontal table as disclosed by Belanger, Jr. to prevent undesired adhesion of the portion of the sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object yet provide a time efficient process by combining the time required to apply the releasing agent and the time required to transport the sheet to the horizontal table.

As to Claim 35, the references as combined (Feygin et al., column 8, lines 15-17) disclose a method in which each sheet is pre-coated on its lower surface with adhesive.

4. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817), Kinzie (US 6,136,132), and Belanger, Jr. (US 4,721,453) as applied to claim 30 above, and further in view of Berman (US 5,071,503). As to Claims 31 and 32, the references as combined do not disclose applying the releasing agent with a releasing agent applicator controlled to selectively apply the releasing agent while the sheet is moving or being held stationary. Belanger, Jr. discloses an apparatus which utilizes a release agent applicator to coat the upper surface of a web being fed through a manufacturing operation (Figure 1, sprayer 36; column 3, lines 18-24). Berman discloses an applicator device for making three-dimensional objects, which selectively coats an upper surface of a stationary web (Figure 1, applicator 24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of the references as combined to provide the releasing agent via an applicator such as

that disclosed by Belanger, Jr. to selectively apply the releasing agent while the sheet is being moved or an applicator such as that disclosed by Berman to selectively apply the releasing agent to stationary sheets.

As to Claim 33, the references as combined (Feygin et al., Figure 2, contour line 80, forming tool 46; column 5, lines 51-56) disclose a method in which each sheet is cut along its respective contour by a cutting tool which is driven in two dimensions to trace the respected contour while the sheet is stationary.

5. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817), Kinzie (US 6,136,132), and Belanger, Jr. (US 4,721,453) as applied to claim 30 above, and further in view of Richards et al. (US 6,161,604). The references as combined (Feygin et al., column 8, lines 15-17) disclose a method in which each sheet is coated on its complete lower surface with adhesive, but do not disclose coating each sheet with adhesive as it is being fed to the horizontal table. Richards et al. discloses a method, which includes coating a completed surface of a web material with adhesive as it is being fed for additional manufacturing operations (Figure 2, adhesive applicator 295). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Feygin et al. to include an adhesive applying step such as disclosed by Richards et al. to eliminate the need for using costly web material that is pre-coated with adhesive.

6. Claims 36-41, 43, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817) in view of Kinzie (US 6,136,132) and Belanger, Jr. (US 4,721,453). As to Claims 36, 37, 40, and 41, Feygin et al. discloses an apparatus for making a three-

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dimensional object (Figure 2) constituted of a plurality of thin preformed sheets (Figure 1, layers 56) each bonded on one side to the next adjacent sheet on its opposite side, with each sheet cut along a contour (Figure 2, contour line) corresponding to the contour of the respective layer constituted by the sheet in the object, the apparatus comprising bonding one side of a sheet to the opposite side of an adjacent sheet such that the remaining portion of the sheet not within the contour is readily separable from the three-dimensional object (Figure 2, cross hatching 82; column 5, lines 55-67; column 6, lines 1-2). Feygin et al. does not disclose a releasing agent applicator. One of ordinary skill in the art at the time of the invention would recognize the advantage of preventing the waste material from undesirably adhering to the sheets forming the three-dimensional object. Kinzie discloses a method of making a three-dimensional object in which a release coating is applied to prevent undesired adhesion (column 12, lines 4-9). Belanger, Jr. discloses an apparatus which utilizing a release agent applicator which coats the upper surface of a moving web being fed through a manufacturing operations (Figure 1, sprayer 36; column 3, lines 18-24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Feygin et al. to include a releasing agent applicator such as that disclosed by Belanger, Jr. for selectively coating the top side of each fed sheet with a releasing agent as disclosed by Kinzie to prevent undesired adhesion of the portion of the sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object.

As to Claim 38, the references as combined (Feygin et al., Figure 1, work table 130, elevator mechanism 131) disclose an apparatus which includes a horizontal table; a feeder for feeding the sheets individually to, and stacking them on, the horizontal table; and a drive for lowering the table as the sheets are successively stacked thereon.

As to Claim 39, the references as combined (Feygin et al., Figure 1, elevator mechanism 131, motor 132, threaded shaft 134, column 7, lines 54-65) disclose an apparatus in which the drive includes a rotary motor and screws driven by the motor and coupled to the corners of the horizontal table for raising and lower the table.

As to Claim 43, the references as combined (Feygin et al., Figure 2, contour line 80, forming tool 46; column 5, lines 51-56) disclose an apparatus in which the cutting tool is driven in two dimensions to trace the respective contour of the sheet while the sheet is stationary.

As to Claim 56, the references as combined disclose an apparatus wherein the releasing agent applicator is configured to apply the releasing agent coating on at least one of the sheets over a majority of the part of the sheet not included within the respective contour (see Claim 36).

7. Claims 42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817), Kinzie (US 6,136,132), and Belanger, Jr. (US 4,721,453) as applied to claim 40 above, and further in view of Berman (US 5,071,503). As to Claim 42, the references as combined do not disclose applying the releasing agent with a movable releasing agent applicator controlled to selectively apply the releasing agent while the sheet is being held stationary. Berman discloses an applicator device for making three-dimensional objects, which selectively coats an upper surface of a stationary web (Figure 1, applicator 24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the references as combined to include a moving applicator such as that disclosed by Berman to selectively apply the releasing agent to stationary sheets.

As to Claim 44, the references as combined do not disclose an apparatus in which the releasing agent applicator and the cutting tool are carried by a common head. Berman discloses



an apparatus for making three-dimensional objects in which an applicator tool and a cutting tool are carried by a common head which is driven in two dimensions to define the contour of a sheet (Figure 1, movable head 22, applicator 24, cutting tool 26; abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the references as combined to place the releasing agent applicator and the cutting tool onto a common head as disclosed by Berman to eliminate the need for two separate tools and their respective means for movement.

8. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817), Kinzie (US 6,136,132), and Belanger, Jr. (US 4,721,453) as applied to claim 40 above, and further in view of Richards et al. (US 6,161,604). The references as combined (Feygin et al., Figure 2, adhesive applicator 295) disclose an apparatus in which each sheet is coated on its complete lower surface with adhesive, but does not disclose an adhesive applicator for coating each sheet with adhesive as it is being fed to the horizontal table. Richards et al. disclose an apparatus, which includes coating a completed surface of a web material with adhesive applicator as it is being fed for additional manufacturing operations (Figure 2, adhesive applicator 295). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the references as combined to include an adhesive applicator such as disclosed by Richards et al. to eliminate the need for using costly web material that is pre-coated with adhesive.

9. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feygin et al. (US 5,730,817) and Kinzie (US 6,136,132) as applied to claim 26 above, and further in view of

Miller (US 3,827,625). The references as combined do not disclose a method in which the selective application of the releasing agent is effected by selective removal of coating of the releasing agent. Miller discloses applying a release coating in a predetermined pattern or as a smooth coating and selectively removing portions of it (column 2, lines 12-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of the references as combined to include applying the releasing coating as a smooth coating and selectively removing portions of it as disclosed by Miller to provide a desired pattern of the release coating such that it only covers areas in which adhesion of the layers of the three-dimensional object is undesired.

#### ***Response to Arguments***

10. In response to the applicant's arguments that one ordinarily skilled in the art attempting to implement a thin-sheet model building system according to the teachings of Feygin et al. would not look to Kinzie for teachings of suitable bonding techniques, the Examiner disagrees. The Examiner maintains that one of ordinary skill in the art at the time of the invention would recognize the advantage of preventing the waste material from undesirably adhering to the sheets being bonded to form the three-dimensional object. The reference of Kinzie discloses a method of making a three-dimensional object by laminating a plurality of layers using a bonding agent such as a pressure sensitive adhesive (column 11, line 64 through column 12, line 4) and details concerns regarding the ease of removing the waste material from the three-dimensional object being formed (column 11, lines 31-49). Kinzie further discloses that the bonding process can also include the selective application of a bond inhibitor such as the coating of a release agent or protective layer (column 12, lines 4-9) to prevent undesired adhesion thereby facilitating

efficient removal of the waste material. The Examiner maintains that the teachings of Kinzie are reasonably pertinent to the particular problem with which the applicant was concerned, which is providing a method of making a three-dimensional object constituted of a plurality of layers with a mechanism for preventing the waste material from undesirably adhering to the sheets being bonded to form the three-dimensional object. The Examiner maintains that the reference of Kinzie both teaches and provides motivation for modifying the method of Feygin et al. to include a step of selectively applying a release coating to prevent the undesired adhesion of the portion of the sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object.

In response to the applicant's arguments that there is no need for selective bonding techniques since the reference of Feygin et al. teaches a technique for facilitating detachment of residue material and that one ordinarily skilled in the art would have no motivation to seek an alternative solution, it is noted that Feygin et al. discloses that the residue material can be removed by variety of methods, only one of which is the cross-hatching method (column 5, lines 56-58; column 5, line 60 through column 6, line 2). Since the disclosed invention of Feygin et al. is not limited to utilizing the cross-hatching method for removing the scrap material, the Examiner asserts that one of ordinary skill in the art would be motivated to seek out other solutions for removing unwanted scrap material, such as the bond inhibiting method disclosed by Kinzie.

In response to the applicant's arguments that one of ordinary skill in the art would reject the teachings of Kinzie as unsuitable for application in the system of Feygin et al., the Examiner asserts that when modifying the method of Feygin et al. as noted above to include a step of selectively applying a release coating to prevent the undesired adhesion of the portion of the

sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object, one of ordinary skill in the art would recognize that the coordinated use of a volatile solvent with the bonding step would not be necessary to integrate a step of selectively applying of a release coating as disclosed by Kinzie to the layers forming the three-dimensional object of Feygin et al. and that it would have been readily apparent to one of ordinary skill in the art at the time of the invention that the release coating applied alone would be sufficient to provide the method of Feygin al. with means for preventing the waste material from undesirably adhering to the sheets forming the three-dimensional object thereby facilitating the removal of the waste material from the three-dimensional object.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cheryl N Hawkins whose telephone number is (571) 272-1229. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (517) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Cheryl N. Hawkins* 5/3/04  
Cheryl N. Hawkins  
May 3, 2004

*Richard Crispino*  
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